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03/20/97

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6 July 1995

Box PATENT APPLICATION
Commissioner of Patents & Trademarks
Washington DC 20231

Sir:

Transmitted herewith for filing is the patent application of Robert L. Frye and Beacher R. Webb, Jr. for NON-CONDUCTIVE OVERHEAD CONVEYOR (Docket PWR 002 P2), comprising

three (3) sheets of drawing, Figs. 1-10 (informal), three sets; nine (9) pages including specification, and six (6) claims, of which two (2) are independent claims;

One Declaration by the inventor³ and one Power of Attorney from the Assignee;

One Statement supporting small entity status;

A postage paid return card.

The assignment of the invention to Florida High Reach, Inc. is being submitted for recording herewith but under a separate cover letter with a separate check for payment of the recording fee.

A check is enclosed in the amount of \$385.00 for the filing fee, calculated as follows:

Basic fee for small entity	\$385.00
claims in excess of 20	0.00
Independent claims over 3	0.00
Multiply dependent claims	0.00

Total	\$385.00
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937-643-0980

Respectfully submitted,

Joseph G. Nauman
Reg. No. 18,032

RECEIVED 05/12/95

PATENT
IN THE UNITED STATES PATENT OFFICE

Application of

Inventor : Robert L. Frye & Beacher R. Webb, Jr.
Serial No.: n/a
Filed : herewith
Title : NON-CONDUCTIVE OVERHEAD CONVEYOR
Art Unit : n/a
Docket No.: PWR 002 P2


Hon. Commissioner of Patent & Trademarks
Washington DC 20231

Sir:

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Date of Deposit 20 March 1997

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above, and is addressed to

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Joseph G. Nauman
Reg. No. 18,032

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Applicant or Patentee: Robert L. Frye, Beacher R. Webb, Jr.
Att.Dkt.No. PWR 002 P2
Serial or Patent No.: new application
Filed or Issued: n/a
For: NON-CONDUCTIVE OVERHEAD CONVEYOR

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I declare that I am

☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf
of the concern identified below:
NAME OF CONCERN Florida High Reach Inc.
ADDRESS OF CONCERN 4701 Crump Road, Lake Hamilton FL 33851

I hereby declare that the above identified small business concern qualifies as
a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37
CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of
Title 35, United States Code, in that the number of employees of the concern,
including those of its affiliates, does not exceed 500 persons. For purposes
of this statement, (1) the number of employees of the business concern is the
average over the previous fiscal year of the concern of the persons employed
on a full-time, part-time or temporary basis during each of the pay periods of
the fiscal year, and (2) concerns are affiliates of each other when either,
directly or indirectly, one concern controls or has the power to control the
other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and
remain with the small business concern identified above with respect to the
invention, entitled Loading and Unloading Assist Apparatus for a Vehicle by
inventor(s) Robert L. Frye and Beacher R. Webb, Jr., described in
☒ the specification filed herewith
☐ application serial no. , filed
☐ patent no. , issued

If the rights held by the above identified small business concern are not
exclusive, each individual, concern or organization having rights to the
invention is listed below* and no rights to the invention are held by any
person, other than the inventor, who could not qualify as a small business
concern under 37 CFR 1.9(d) or by any concern which would not qualify as a
small business concern under 37 CFR 1.9(d) or a nonprofit organization under
37 CFR 1.9(e). *NOTE: Separate verified statements are required from each
named person, concern or organization having rights to the invention averring
to their status as small entities. (37 CFR 1.27)

NAME None
ADDRESS

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION
I acknowledge the duty to file, in this application or patent, notification of

any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

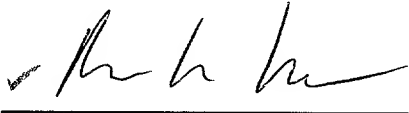
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Beacher R. Webb, Jr.

TITLE OF PERSON OTHER THAN OWNER President

ADDRESS OF PERSON SIGNING 4701 Crump Road, Lake Hamilton FL 33851

SIGNATURE



DATE: 15 March 1997

NON-CONDUCTIVE OVERHEAD CONVEYOR**Field of the Invention**

This invention relates to boom type conveyors need to deliver packages or materials onto roofs or other elevated locations.

Cross-Reference to Related Application

This application is related to U.S. Patent Application Serial No. 08/449,864 filed 10 July 1995, now U.S. Patent No. issued .

Background of the Invention

This invention relates particularly to overhead conveyors as are used to deliver, or in some cases to remove, materials from high places such as roof tops. In particular, the invention applies to such conveyors which are mobile, i.e. vehicle mounted, and may be part of a delivery truck for transporting materials such as roofing shingles. The truck is driven into a site where roofing or the like is to be applied or repaired, and the conveyor is positioned as to its elevation and azimuth using its own power drive equipment.

A major problem with such conveyor systems is the danger presented by nearby overhead electrical wires, which often are high tension lines in which the applied voltage may be anywhere from several kilovolts to several megavolts. Major accidents, with loss of life and/or severe injuries to operating personnel and destruction of equipment, occur when a metal overhead conveyor structure (e.g. boom) momentarily contacts this wiring.

Step ladders or extension ladders constructed of electrically non-conductive parts are available to workmen in lengths up to about 24 feet, but those are intended only for climbing and possibly carrying of small equipment or supplies, up to about 50 pounds in weight.

Heavy duty equipment, such as the mobile overhead conveyor systems, has traditionally been constructed of

metal, and thus such equipment is highly susceptible to overhead wire accidents. Some of these accidents are so severe that the conveyor and its supporting truck is destroyed, with some of the heavy structural members being partially melted or distorted. The released electrical energy has been known to jump to adjacent vehicles and destroy or damage them also. Of course, any person in contact with this equipment at the time is subjected to a high electrical discharge, and if the person is fortunate enough to survive he is usually severely injured.

To minimize this type of accident, there is a need for electrically non-conductive overhead conveyor equipment which is robust enough to withstand heavy usage and large forces.

Summary of the Invention

The present invention provides heavy duty overhead portable conveying equipment which is electrically non-conductive, to the extent of being capable, when ground based, of withstanding contact with kilovolt power lines and not providing an accidental grounding path. The conveyor is provided with a non-conductive boom which includes a boom frame made of reinforced fiberglass beams and/or trusses, driving and idler drums at opposite ends of the boom frame, a fluid power (preferably hydraulic) drive motor coupled to the driving drum, non-conductive hose forming the supply and return of pressurized fluid for the motor, and a non-conductive belt, as of polypropylene, passing around the drums and guided by plastic guide strips.

The principal object of the invention is to provide a mobile power driven conveyor for moving packages to and from various elevated locations, wherein the conveyor is so constructed that it has an essentially electrically non-conductive boom member, including a power driven conveyor belt, to offer protection against accidental contact of the boom member with electrical lines.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

Brief Description of the Drawings

5 Fig. 1 is a perspective view of a flat bed truck fitted with a conveyor provided by the invention;

Fig. 2 is a schematic side view showing the truck bed location with the boom lowered, the boom structure being shown broken and shortened;

10 Fig. 3 is a top view of the boom structure as seen in Figs. 1 and 2;

Fig 4 and 5 are enlarged top and side views showing the drive and drive rollers, and the belt return guides;

15 Fig. 5 is a cross-section view showing the hydraulic lines and the belt return guide rollers;

Figs. 6 and 7 are cross-section views through the boom, taken along lines 6--6 and 7--7 in Fig. 2;

20 Figs. 8 is an enlarged side view of the lower end of the boom and its supporting structure, for mounting on a track bed;

Fig. 9 is an enlarged segmental view of the boom showing reinforcements to resisting twisting lengthwise of the boom; and

Fig. 10 is a segmental side view of the reinforcements.

Description of the Preferred Embodiment

Referring to Figs. 1, 2 and 3, which are overall views of the novel overhead conveyor mounted on a transport flat bed truck, the truck has a bed 10 for supporting loads, such as pallet loads of roofing shingle packages, and which is
30 fitted with a turret 15 at the rear of truck bed 10. Turret 15 includes a rotatable base 17 for the conveyor boom 20. Adjacent to turret 15 is a control console 18, (Fig. 1) from which various hydraulic motors are controlled to raise and lower the boom, i.e. change its angle with respect to base
35 17, and to move the boom from side to side of the truck bed,

by rotating turret 15. The discharge conveyor, normally used for off-loading of packages, has an elongated boom 20, as later described, supporting the upper and lower shafts 35, 36 of an endless conveying belt 50, which has lugs or plates 55 fitted cross-wise to belt 50, so as to support packages rested on the belt while it is driven to move the packages upward along the boom.

As explained in the related application, a pair of telescoping tubes form the support for boom 20, the upper tube having a pivot connection to the boom structure. A roller bearing provides rotational support for the vertical tubes along with a lower thrust bearing at the bottom of the lower tube.

The upper one of the telescopic tubes has a pivot connection to a support cradle 21 which is attached to the rails of the boom structure. An azimuth control hydraulic cylinder 23 is attached between cradle 21 and the upper support tube.

The main elongated boom structure 20 includes side rails 22 having first (lower) ends 24 and second (upper) ends 25. The rails 22 are constructed of fiberglass reinforced plastic material, which has a high electrical dielectric value, sufficient so as not to break down under application of electrical potentials of one kilovolt or more, such as are encountered in overhead electrical power transmission lines. Cross members 26, which may be of fiberglass or of steel or other structural metal extend between and are secured to side rails 22, 24 at predetermined intervals, preferably spaced apart about three feet.

Stringer members 28 are secured along the tops of cross members 26. The stringer members preferably are fiberglass reinforced plastic beams having a shallow C-shaped cross-section (Fig. 7), those stringers located adjacent side rails 22 being positioned facing inward (downward) of the

boom structure, and the central stringer member (of which there can be more than one) being positioned facing outward (upward) of the boom. The upward facing parts of stringer members 28 cooperate with the tops of side rails 22 to form
5 a support over which a conveyor belt can move.

Each of cross members 26 is thus electrically isolated (if made of metal), there being a gap between them of approximately three feet or more sufficient to avoid breach of the gap between the cross members by an imposed high
10 voltage. The side rails and cross members provide a top portion 30 of boom structure 20, and a passage 32 internal of the boom structure. Belt return guides 29 are fastened to the insides of rails 22, facing inward of the interior of the boom structure.

15 Upper and lower cross shafts 35 and 36 are rotatably mounted between side rails 22, 24 adjacent the lower and upper ends thereof. A first roller assembly 38 is carried on lower cross shaft 36, and either roller assembly 38 or shaft 36 is freely rotatable, thus functioning as an idler
20 drum. A second roller assembly 40 is fixed to cross shaft 35, and is driven by a fluid power (hydraulic) motor 42, via a chain and sprocket drive 44.

A conveyor belt 50 of electrically non-conductive material, such as polypropylene, extends along the boom
25 structure 20 and about roller assemblies 38, 40 forming an upper conveying flight 56 along the top portion of boom structure 20, and a return flight 57 through passage 32. It should be understood that rubber type (synthetic or natural) belt materials are not satisfactory due to the carbon
30 content of such belting which does not present the necessary resistivity to high voltage potentials. The conveyor lugs 55 are secured across belt 50 at spaced intervals, as seen in the drawings, to assist in moving materials, such a shingle packages, upward to the top of boom structure 20.
35 Since lugs 55 are spaced apart along belt 50 by a

considerable distance (e.g. six feet) there is a substantial dielectric gap between successive lugs, so they can be made of metal or a reinforced plastic material.

5 The means for driving belt 50 to move upper flight 56 in the desired direction along the boom structure 20 is provided by hydraulic motor 42, which is preferably reversible so the conveyor could be used for down-loading if desired. Supply and return of fluid under pressure to motor 42 is provided via hoses 60A, 60B (Figs. 4, 5, and 6) which
10 are also of non-conductive materials. The hoses are arranged within a one side of passage 32 within the cross-section of boom structure 20. A typical control circuit is disclosed in the aforementioned related patent application.

The boom structure can be supplied in various lengths.
15 To minimize twisting about the longitudinal axis of the boom, a section of a stiff box-like member is provided within the middle of the boom structure, as can in Figs. 9 and 10. This section comprises four longitudinal tubes or beams 65 welded to cross pieces 66, the whole box-like
20 structure being incorporated within the boom structure 20, as shown.

While the form of apparatus herein described constitutes a preferred embodiment of this invention, it is to be understood that the invention is not limited to this
25 precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A mobile power driven conveyor for moving packages to and from various elevated locations, comprising

a main elongated boom structure including side rails
5 having first and second ends,

cross members extending between and secured to said side rails at predetermined intervals, said side rails and cross members defining a top portion and a bottom portion of said boom and an passage internal of said boom,

10 cross shafts rotatably mounted between said side rails adjacent said ends therefor,

first and second sets of rollers carried on said cross shafts, respectively,

at least said side rails being formed of an
15 electrically non-conductive material,

a conveyor belt of electrically non-conductive material extending along said boom and about said rollers forming an upper conveying flight along the top portion of said boom and a return flight through said passage,

20 conveyor lugs secured across said belt at spaced intervals,

means for driving said belt to move said flights along said boom,

a supporting mount secured to said boom adjacent said
25 first ends of said side rails, said mount being arranged to raise and lower said boom and to swing said boom from side to side about said mount.

30 2. A mobile conveyor as defined in claim 1, wherein the side rails are fiberglass reinforced structural plastic beams.

3. A mobile conveyor as defined in claim 1, wherein the belt is made from polypropylene.

4. A mobile conveyor as defined in claim 1, wherein said means for driving said belt is a hydraulic motor, and hoses of non-conductive material providing supply and return of hydraulic fluid to said motor.

5

5. A mobile power driven conveyor for moving packages to and from various elevated locations, comprising

a main elongated boom structure including side rails of filament reinforced electrically non-conductive material having an upper end and a lower end,

10

cross members extending between and secured to said side rails at predetermined intervals, said side rails and cross members defining a top portion and a bottom portion of said boom and an passage internal of said boom,

15

lower and upper cross shafts rotatably mounted between said side rails adjacent said respective lower and upper ends thereof,

first and second sets of rollers carried on said cross shafts, respectively, said set of rollers at said upper end being secured to the shaft,

20

a conveyor belt of electrically non-conductive material such as polypropylene extending along said boom and about said rollers forming an upper conveying flight along the top portion of said boom and a return flight through said

25

passage,

conveyor lugs secured across said belt at spaced intervals,

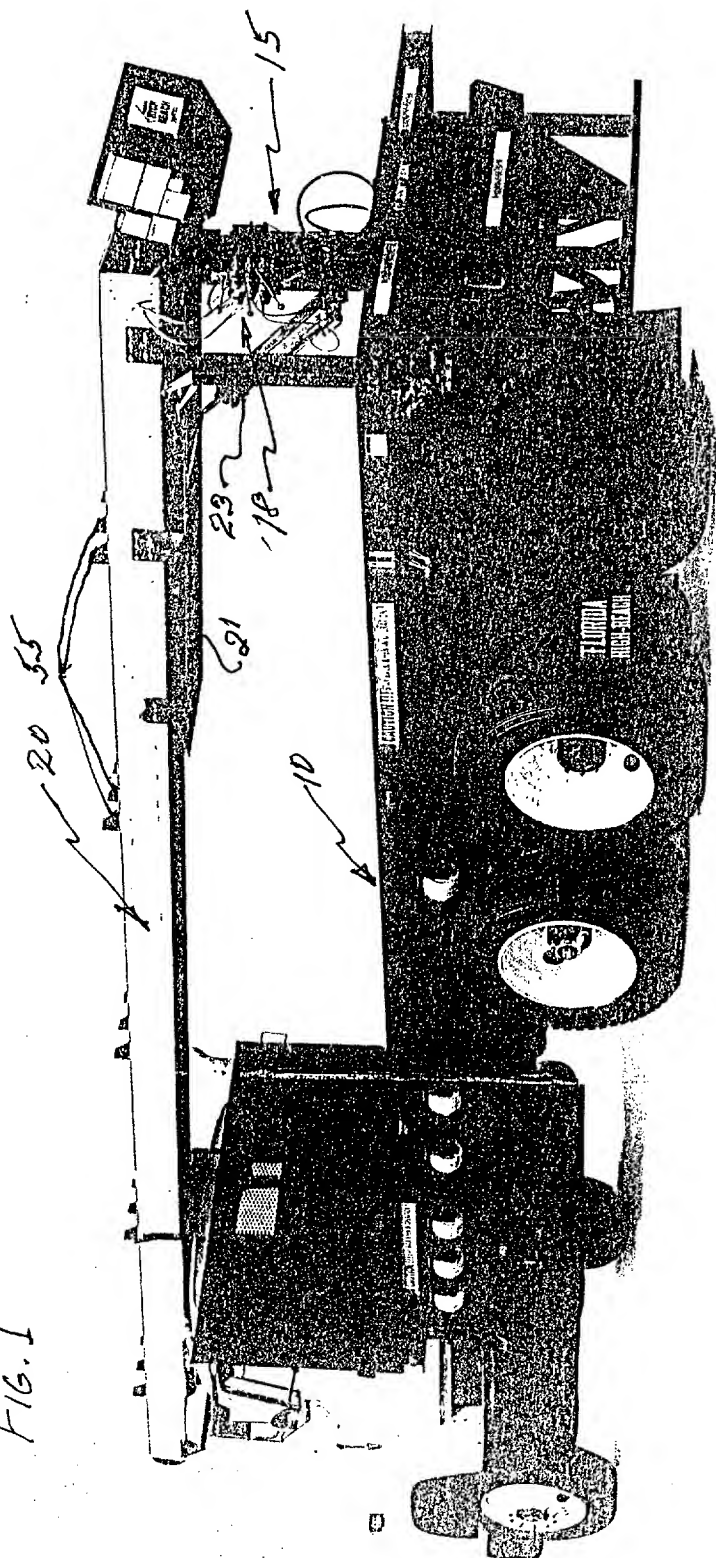
means for driving said upper shaft to move said flights of said belt along said boom,

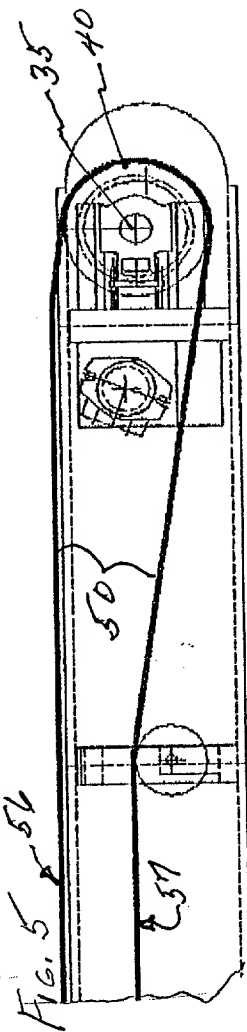
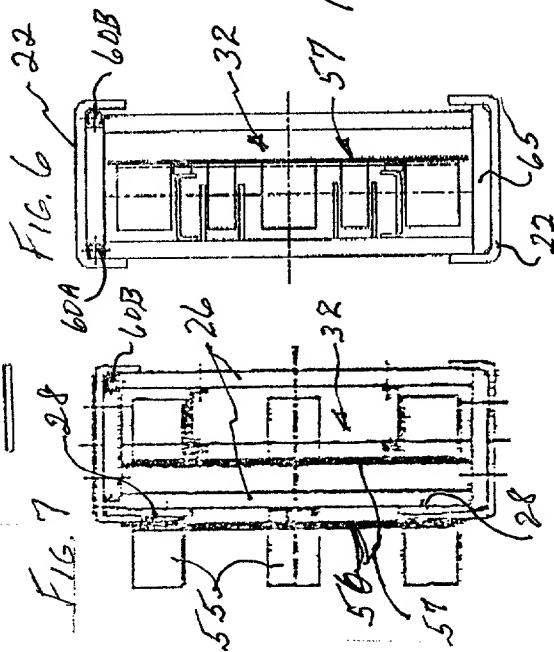
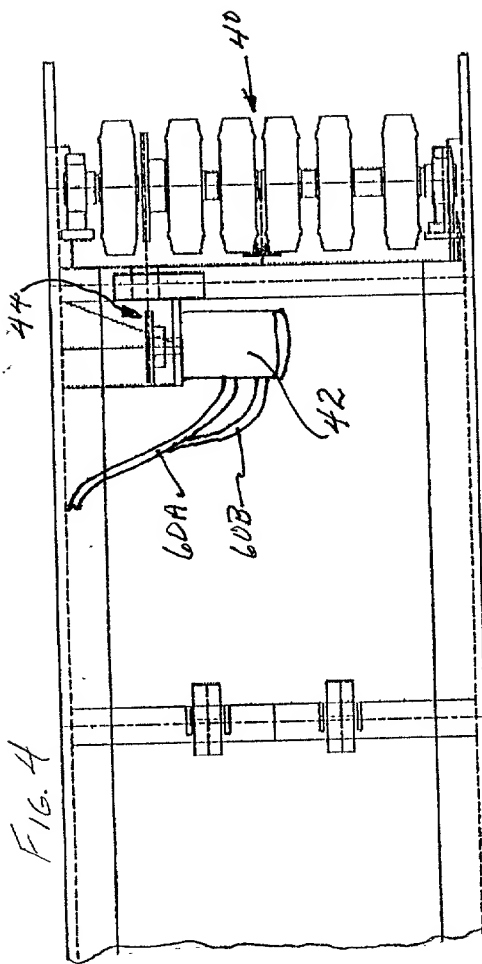
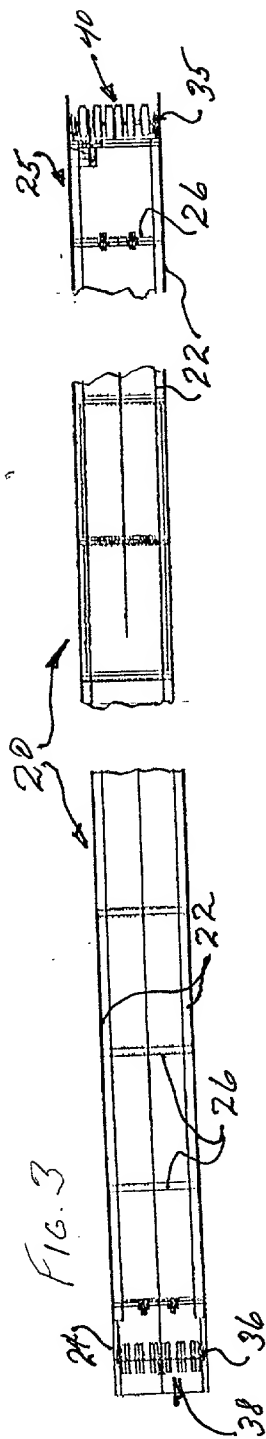
30

a supporting mount secured to said boom adjacent said lower ends of said side rails, said mount being arranged to raise and lower said boom and to swing said boom from side to side about said mount.

6. A mobile conveyor as defined in claim 5, wherein said means for driving said upper shaft is a hydraulic motor supported in said upper end of said boom, and hoses of non-conductive material extending internally of said boom providing supply and return of hydraulic fluid to said motor.

FIG. 1





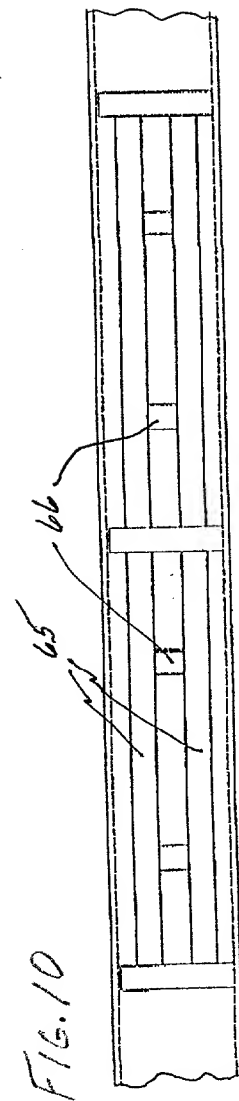
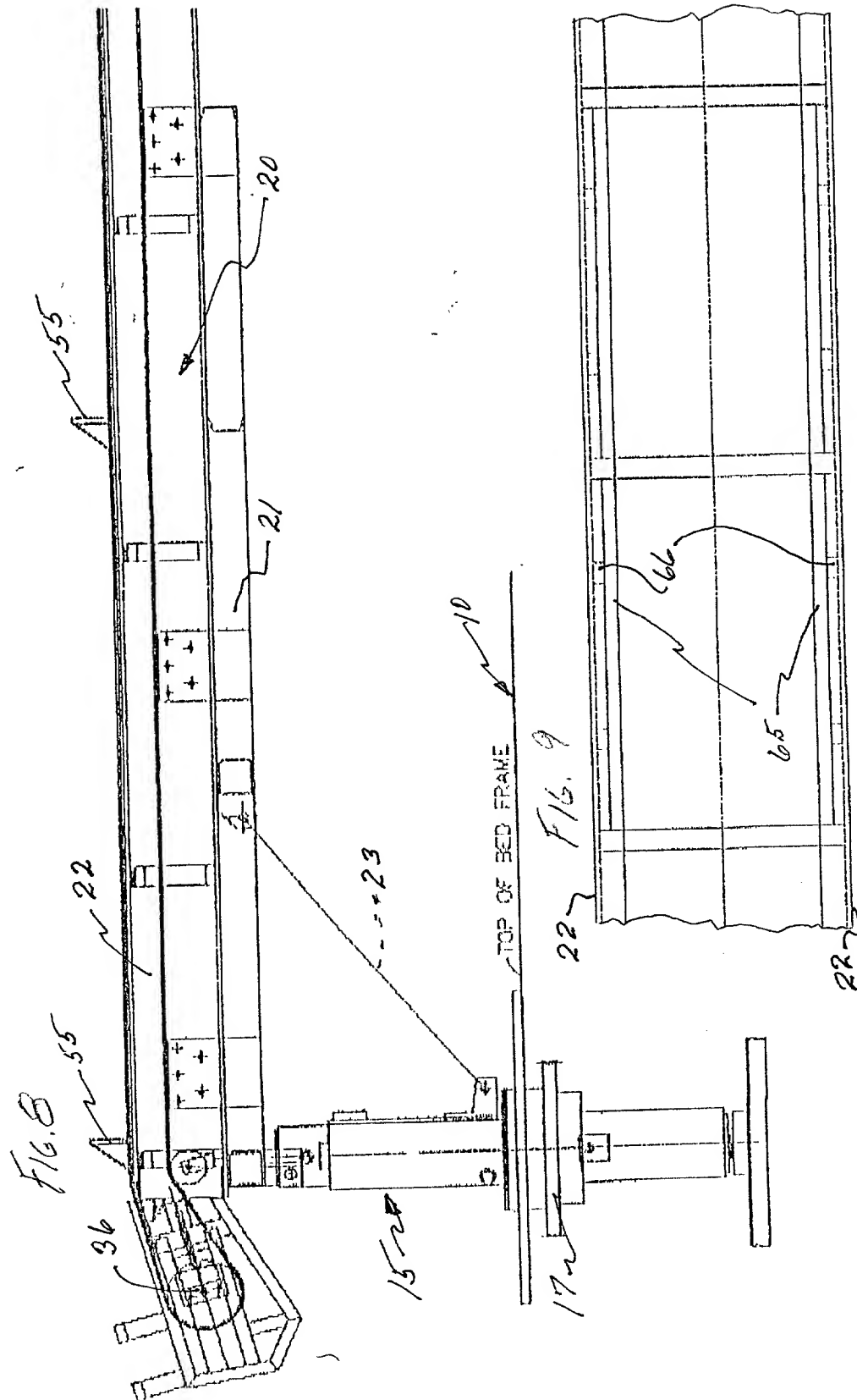
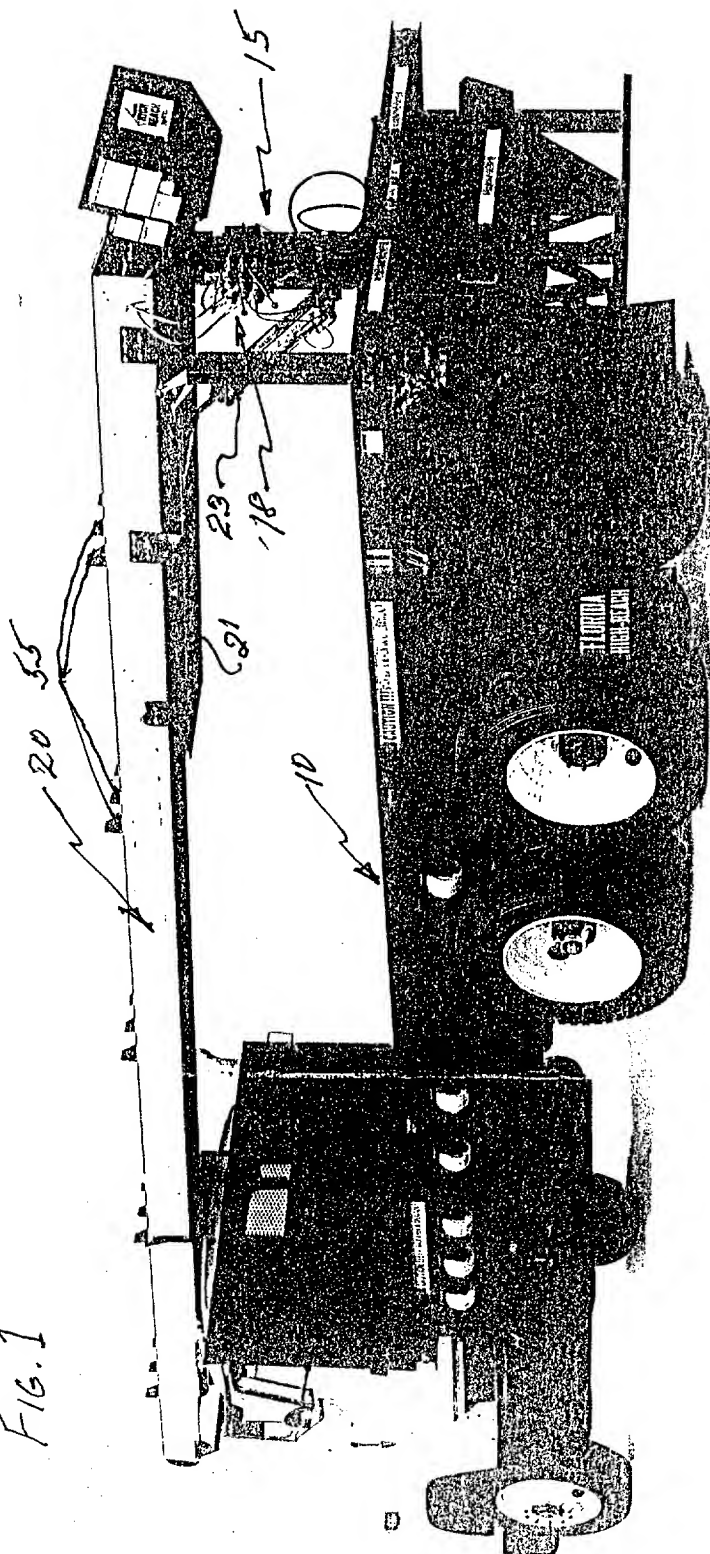
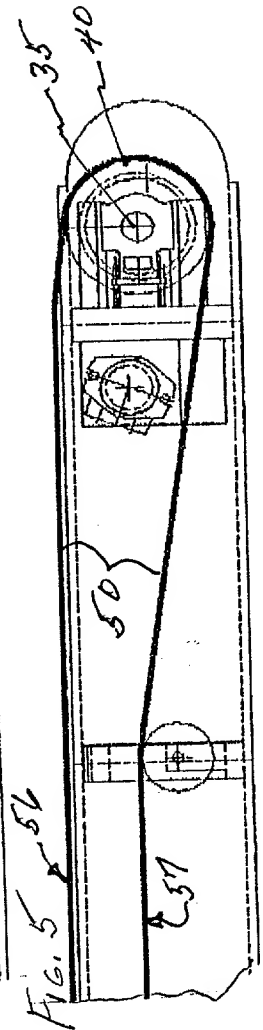
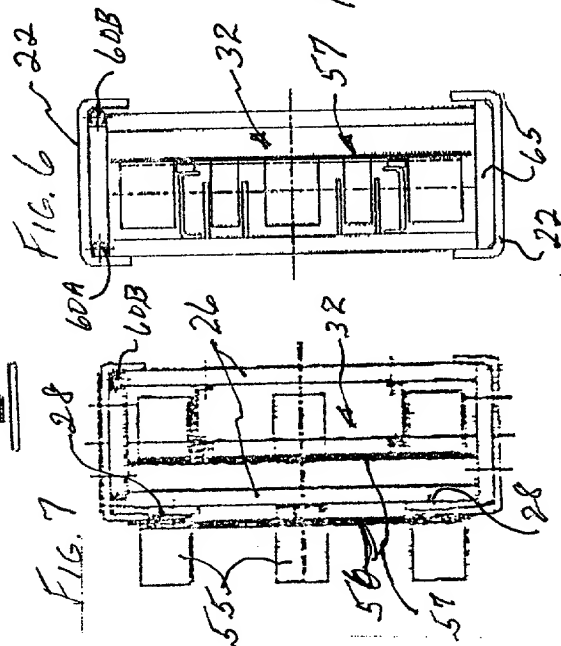
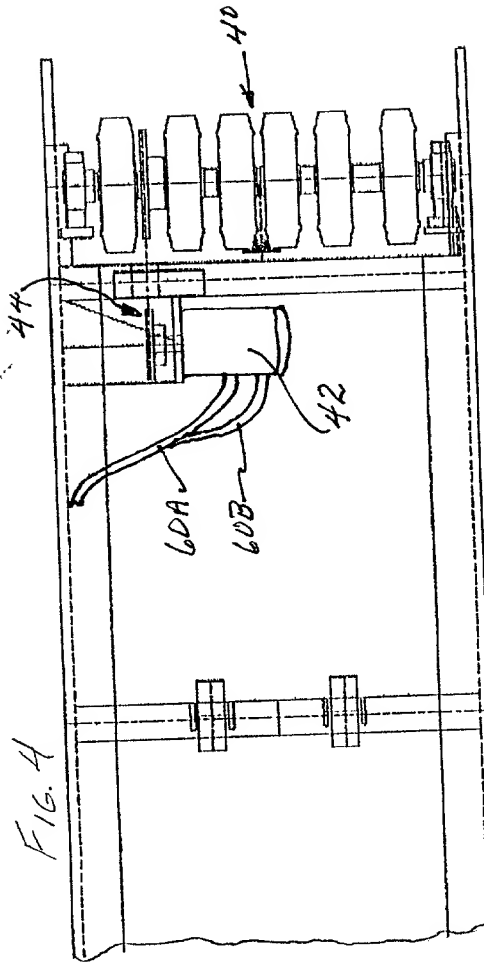
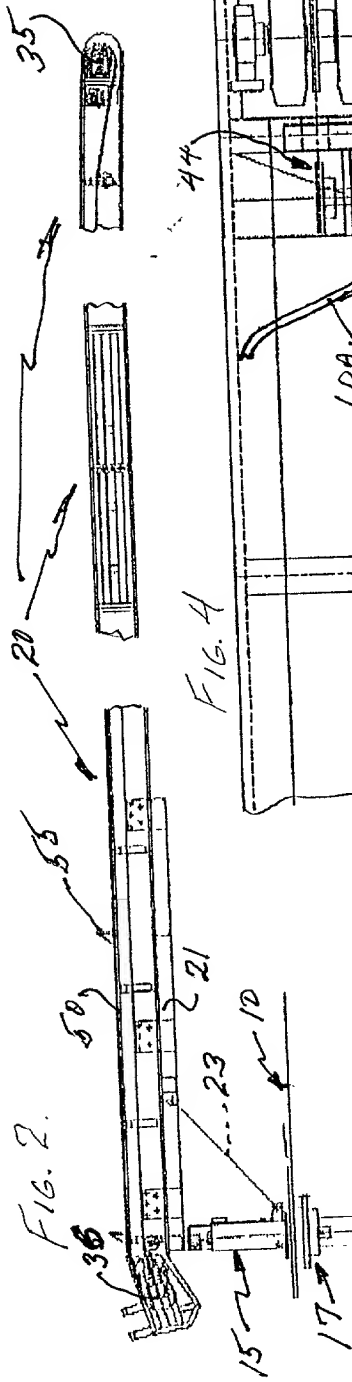
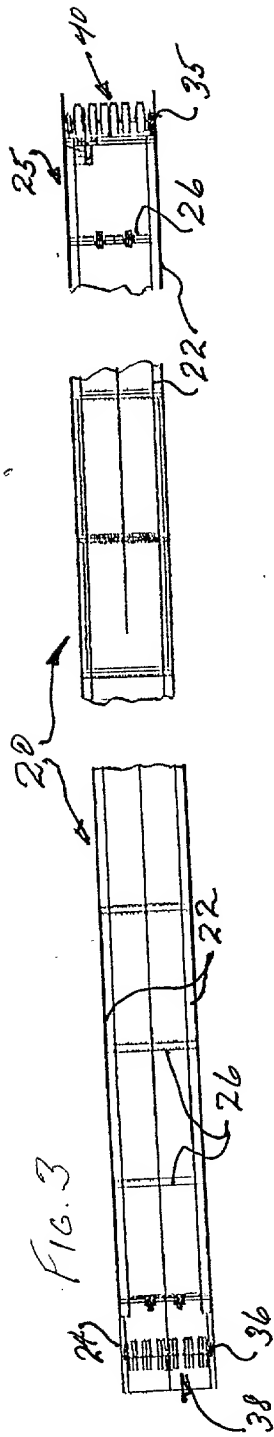


FIG. 1





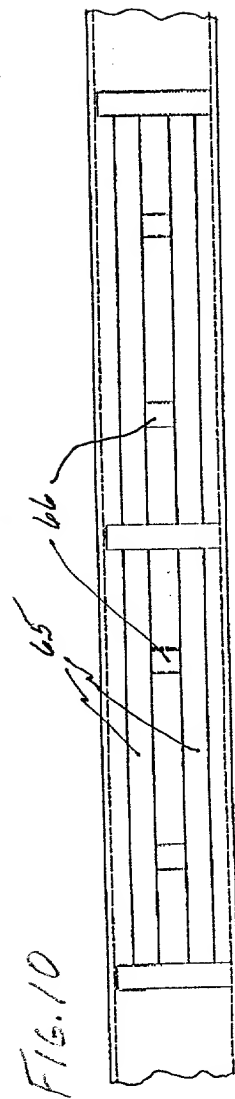
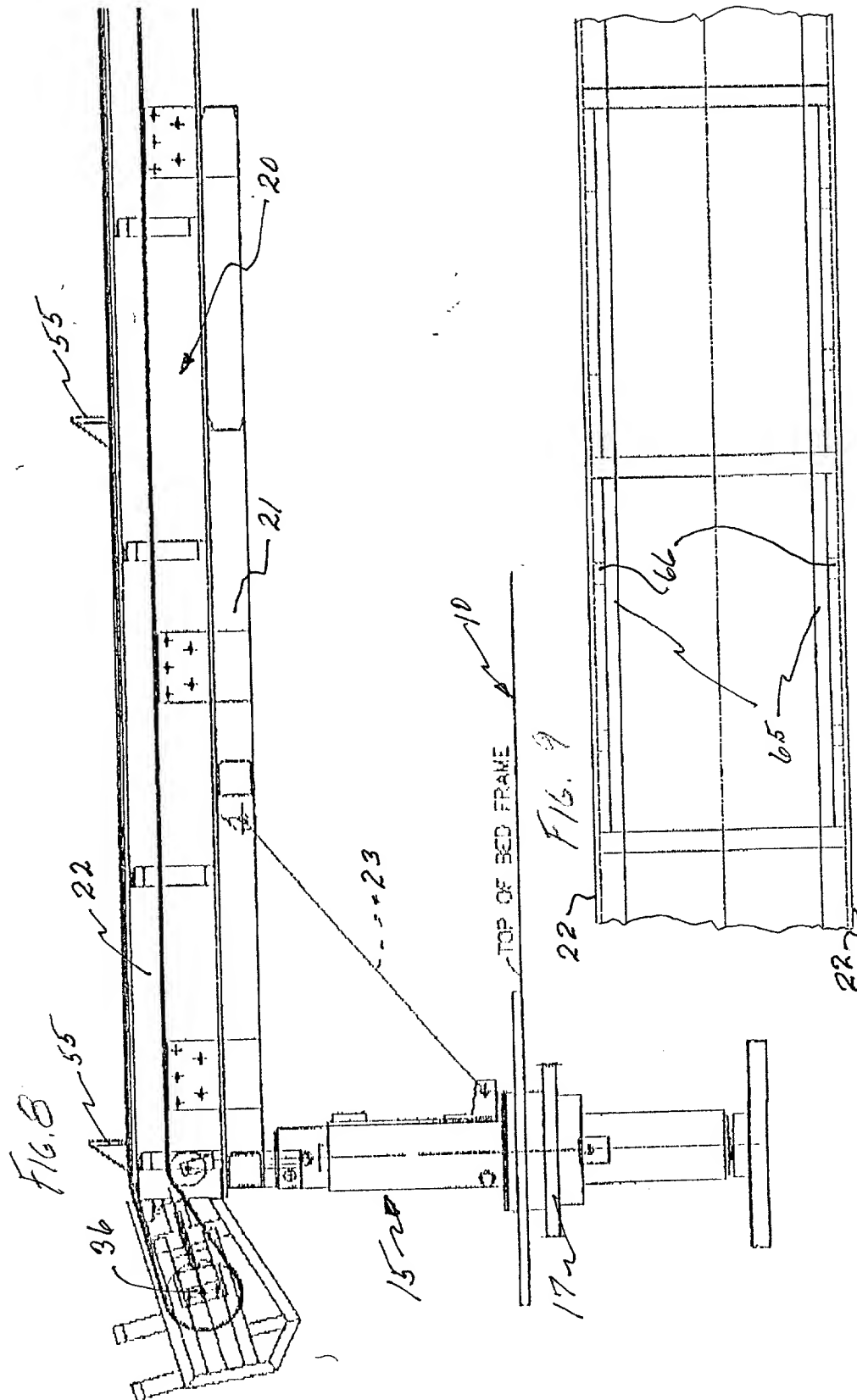
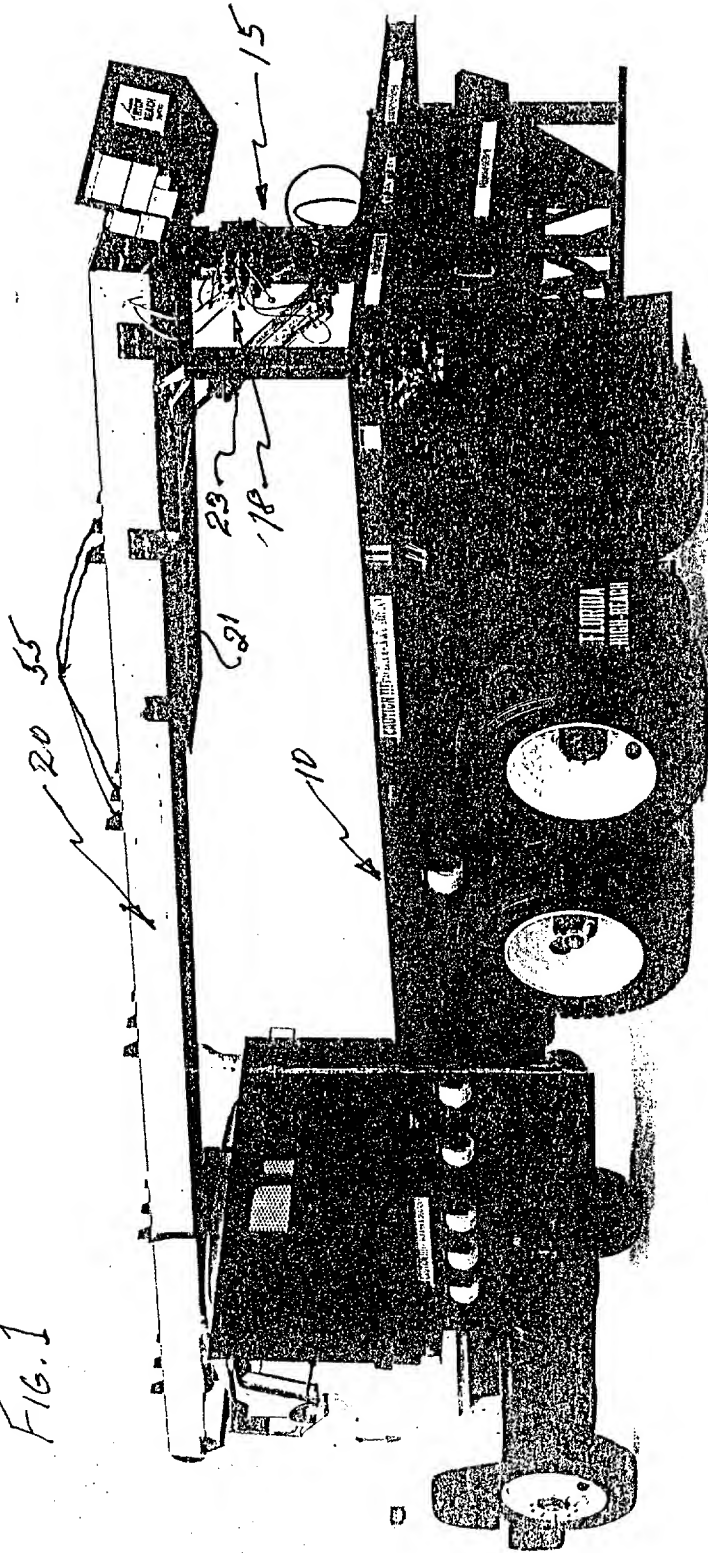
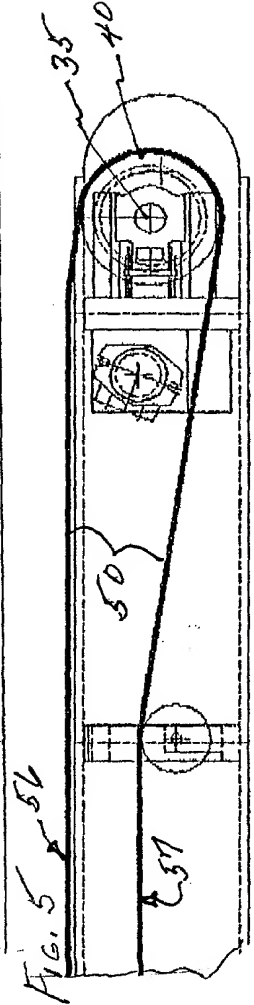
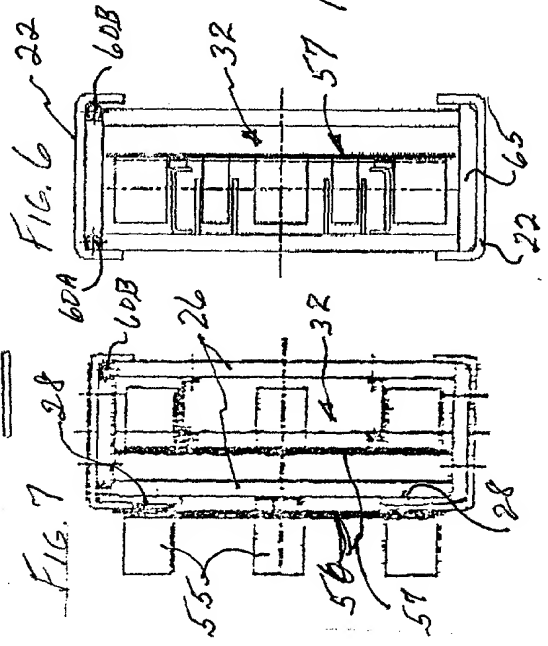
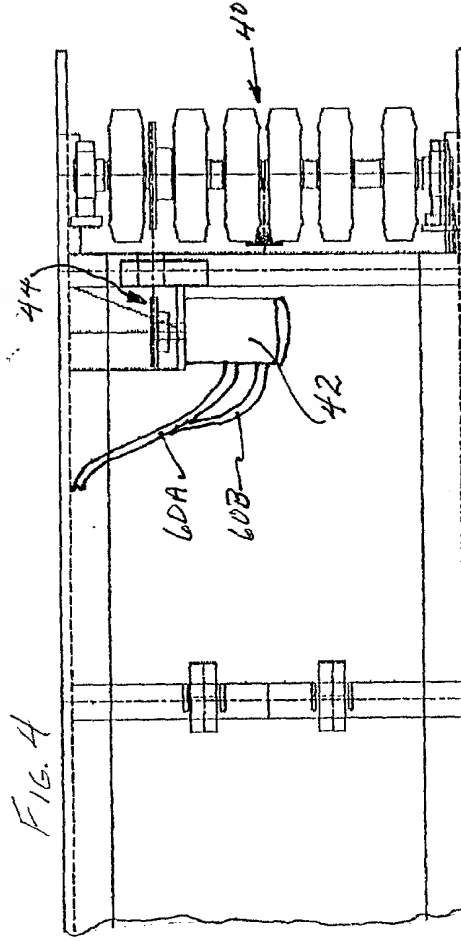
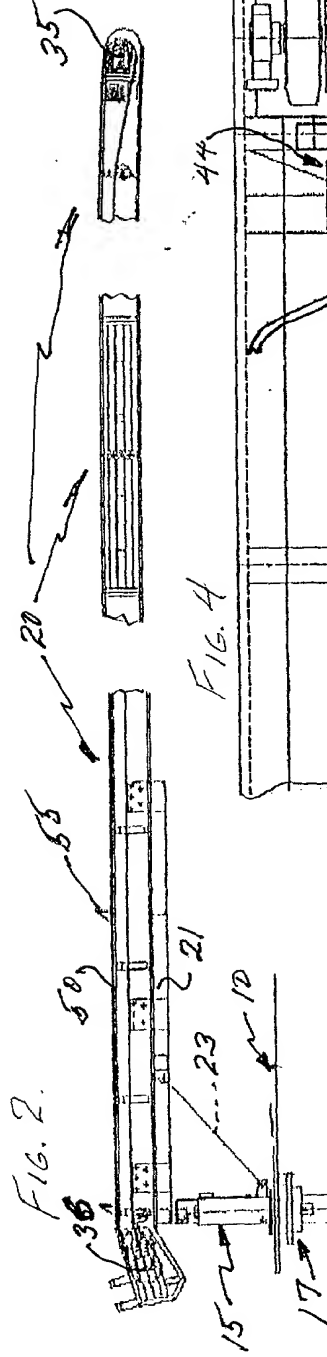
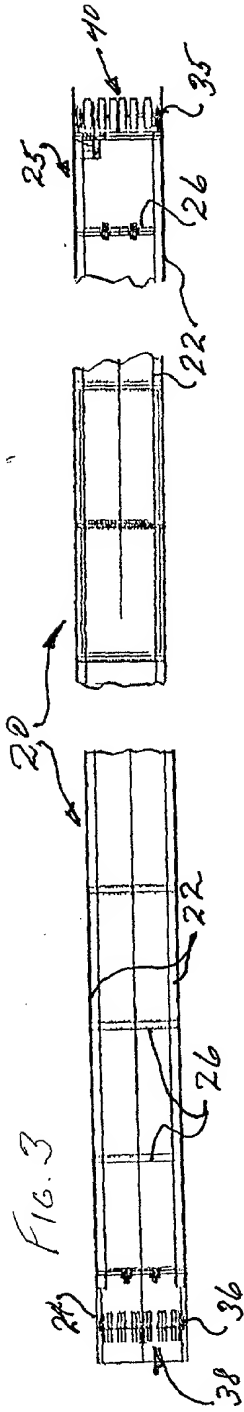
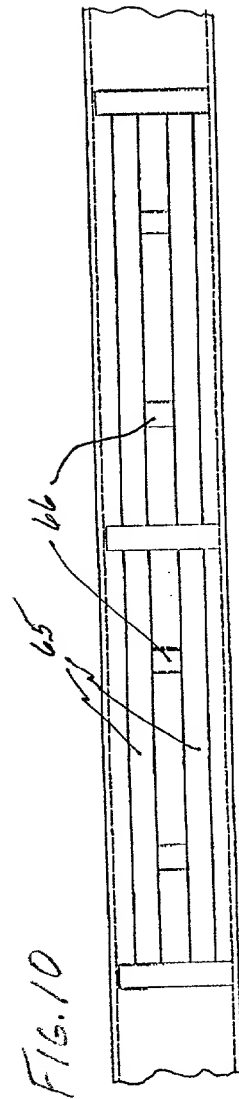
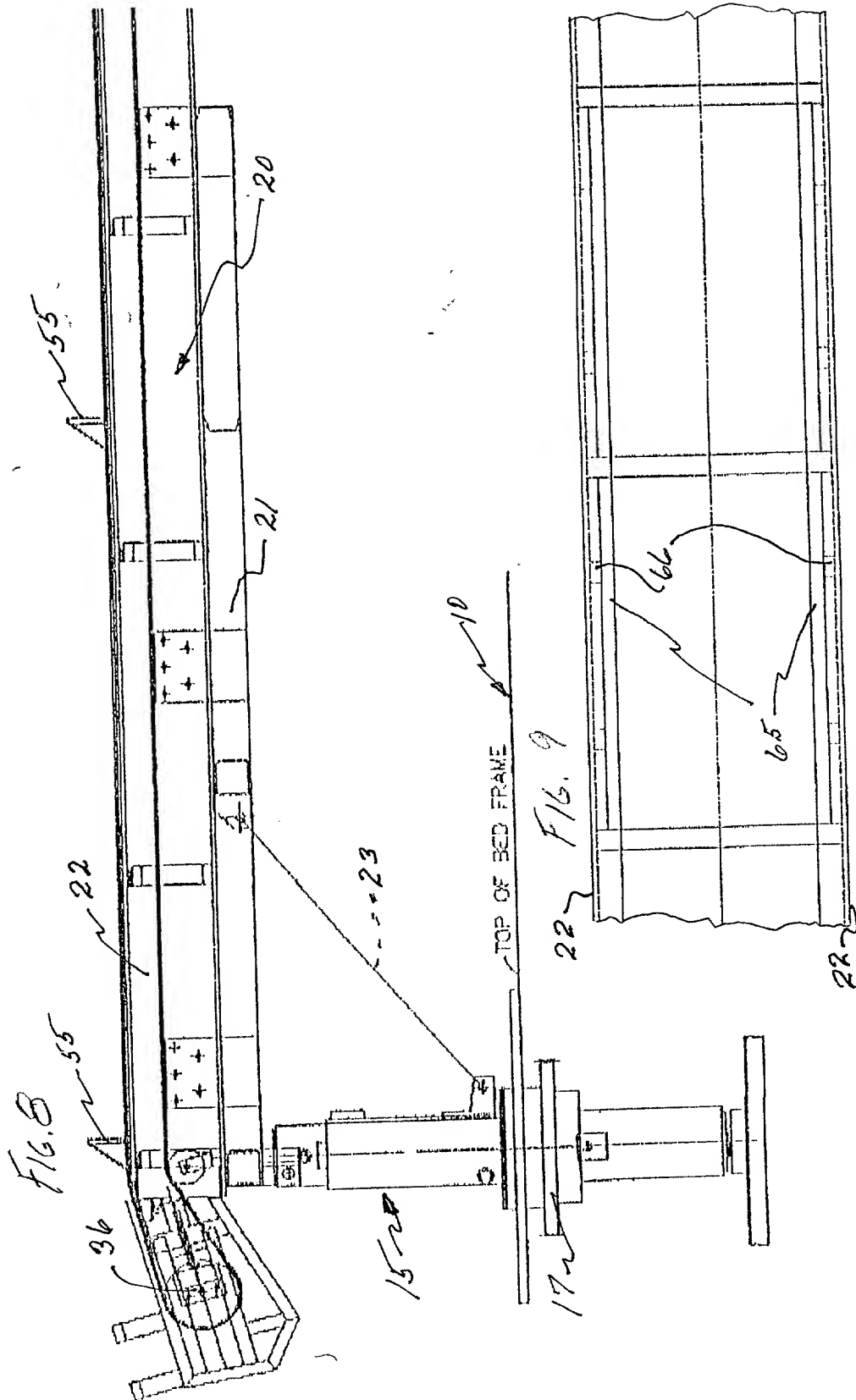


FIG. 1







DECLARATION IN SUPPORT OF PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled:

NON-CONDUCTIVE OVERHEAD CONVEYOR, described and claimed in the attached specification;

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as filed and as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of sole or first Inventor: Robert L. Frye

Inventor's signature: 


Date: 18 March 1997

Residence: Rt. 1 Box 499A, SALUDA SC 29138

Citizenship: U.S.A.

Post Office Address: Florida High Reach
P.O. Box 808
4701 Crump Rd., Lake Hamilton FL 33851

Full name of second inventor: Beacher R. Webb, Jr.

Inventor's signature: 

Date: 15 March 1997

Residence: 177 Clark Ave., Waynesville OH 45068

Citizenship: U.S.A.

Post Office Address: Florida High Reach
P.O. Box 808
4701 Crump Rd., Lake Hamilton FL 33851

2025 RELEASED

POWER OF ATTORNEY

Whereas, Florida High Reach Inc. a Corporation of the State of Florida, having a place of business at 4701 Crump Road, Lake Hamilton FL 33851, is the owner by assignment of the entire right, title and interest in and to United States Patent Application entitled NON-CONDUCTIVE OVERHEAD CONVEYOR (Docket PWR 002 P2), Serial No. (new application) and of the inventions described and claimed therein;

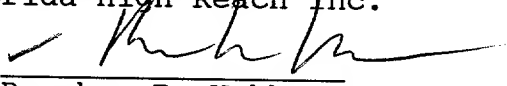
Florida High Reach Inc. hereby appoints:

Joseph G. Nauman Reg. No. 18,032

its attorney with full power of substitution and revocation, to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith.

Please direct all telephone calls to
(937)643-0980
and address all correspondence to
Joseph G. Nauman
P.O. Box 292470
Dayton, Ohio 45429

Florida High Reach Inc.

By 
Beacher R. Webb, Jr.
Its President

March 15, 1997

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